Alerts, Notices, and Case Reports

Retroperitoneal Hematoma as a Complication of Pudendal Block
Diagnosis Made by Computed Tomography

RICHARD B. KURZEL, PhD, MD
Chicago, Illinois

ANH H. AU, MD
SEYED A. ROOHOLAMINI, MD
Sylmar, California

INADVERTENT VASCULAR INJURY to the internal pudendal artery is the most common complication of pudendal block given for obstetric anesthesia for impending vaginal delivery. We report a case of retroperitoneal hematoma thought to arise from pudendal block. The diagnosis was made by computed tomography (CT). This is the first report on the use of such imaging to diagnose this common and probably underdiagnosed complication.

Report of a Case

The patient, a 17-year-old woman, gravida 1, para 0, was admitted for the induction of labor at 39⅞ weeks' gestation for oligohydramnios. She had an amniotic fluid index of 3.2, and intrauterine growth retardation was suspected. At 24 weeks, she was noted to have a hematocrit of 0.36 (35.7%). On admission her blood pressure was 120/68 mm of mercury, her pulse rate was 90 beats per minute, and respirations were 20 per minute. The fetus was monitored during labor with continuous electronic fetal monitoring, and the fetal heart rate showed no abnormal patterns throughout. The patient's labor progressed normally, culminating with the vaginal delivery of a female infant (2,555 grams, Apgars 8 and 9). Before delivery, a pudendal block was carried out, with the administration of 15 ml of a 1% lidocaine solution to each side. Aspiration after each injection yielded no blood return. No episiotomy was done, and a third-degree vaginal laceration resulted, which was repaired. The estimated blood loss from the delivery was 200 ml.

After the delivery, the patient had no severe abdominal pain, changes in her vital signs, or heavy vaginal bleeding. Therefore, there was no suspicion of uterine rupture, and a postpartum manual uterine exploration was not done. While in the recovery room over the next two hours, her vital signs were stable as follows: blood pressure, 124 to 141/60 to 81 mm of mercury; pulse rate, 108 to 119 beats per minute; and respirations, 18 to 20 per minute. Although she was not hypotensive, she did have a persistent tachycardia. Her vital signs also remained stable over the next three days, being in the range of the following: blood pressure, 110 to 120/70 mm of mercury; pulse rate, 80 to 100 beats per minute; and respirations, 18 to 20 per minute. Her hematocrit on admission was unknown, and therefore the magnitude of the initial drop in the hematocrit is unknown. On postpartum day 2, her hematocrit was 0.35 (35%) and dropped to 0.34 (33.7%) on postpartum day 3.

On postpartum day 2, the patient complained of abdominal distention, had decreased bowel sounds, and had a fever of 38.7°C (102°F). The next day she had back pain, pain to the right inguinal area, and persistence of fever to 38.1°C (100.6°F). Investigation for possible causes of her fever was started, and no obvious source was found, other than presumed breast engorgement; hence, the patient was discharged. Two days later, she was readmitted to the hospital with fever and chills for one day, diarrhea for three days, and increasing abdominal pain with radiation to the right lower quadrant and right flank. On examination she was noted to have a blood pressure of 132/78 mm of mercury, a pulse rate of 135 beats per minute, respirations 20 per minute, and a temperature of 38.7°C. The abdomen was mildly distended, bowel sounds were decreased, and she had voluntary guarding and pain to palpation to the right lower quadrant and right costovertebral angle. Her complete blood count showed a leukocyte count of 18.4×10^9 per liter (18,400 per mm^3), and her hematocrit was 0.29 (28.8%). Her urine showed no evidence of urinary tract infection, and there was no evidence of endomyometritis.

Because of concern over possible appendicitis versus a pelvic abscess, a CT study was done. This was performed with an intravenous contrast medium (gadolinium) using the Model 9800 General Electric CT scanner (Milwaukee, Wisconsin) and a CT-section thickness of 10 mm. Seen on CT (Figure 1) was an inhomogeneous fluid collection in the right retroperitoneal space along the iliac and psoas muscles, extending superiorly from the midpelvis to the infrarenal fossa. This fluid collection was consistent with hemorrhage. Incidentally seen was an enlarged postpartum uterus somewhat deviated to the left, which was without evidence of perforation of the uterine wall. A small amount of free fluid was present in the pelvis, and blood (lochia) was noted in the uterine cavity.

With this information, a diagnosis of an infected retroperitoneal hematoma was made, probably resulting from the perforation of a pudendal vessel in the course of the pudendal block. The patient was treated conservatively with broad-spectrum antibiotics having anaerobic coverage (ampicillin and sulbactam sodium [Unasyn;

(Kurzel RB, Au AH, Rooholamini SA: Retroperitoneal hematoma as a complication of pudendal block—Diagnosis made by computed tomography. West J Med 1996; 164:523-525)

From the Departments of Obstetrics and Gynecology (Dr Kurzel) and Radiology (Drs Au and Rooholamini), University of California, Los Angeles, Olive View–UCLA Medical Center, Sylmar, California. Dr Kurzel is now affiliated with the Mount Sinai Hospital and The Chicago Medical School, Chicago, Illinois.

Reprint requests to Richard B. Kurzel, PhD, MD, 900 Ogden Ave, No. 345, Downers Grove, IL 60515.

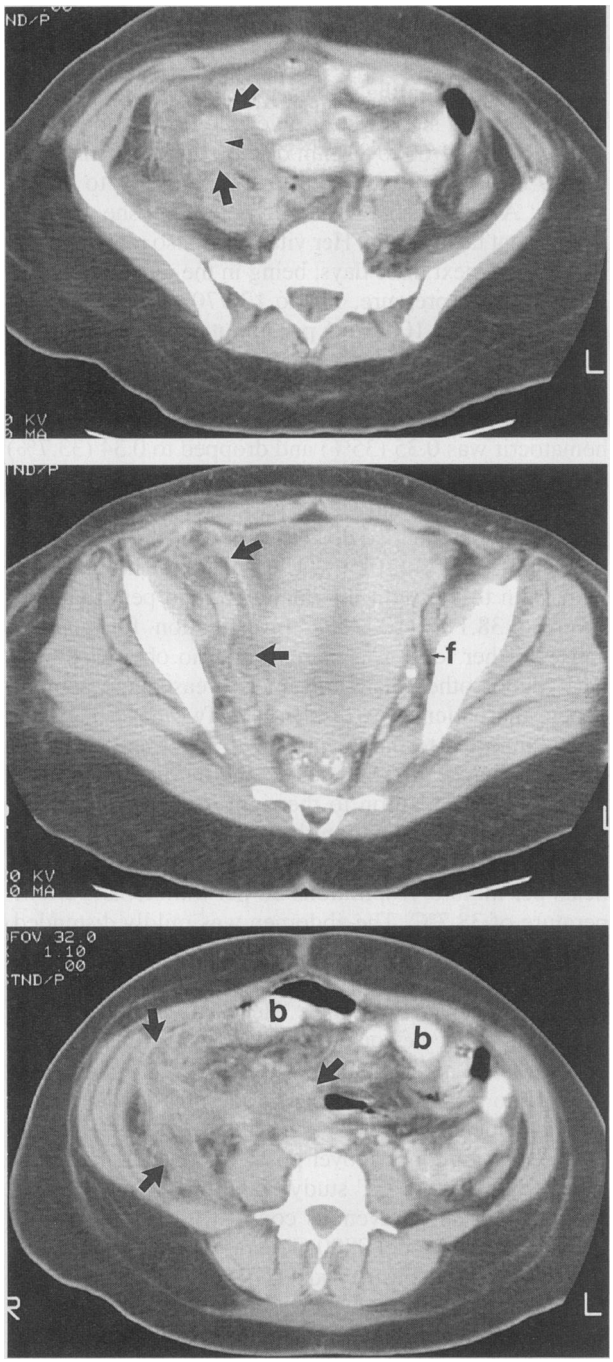

Figure 1.—Routine axial computed tomographic (CT) scan images (after the intravenous administration of contrast media) at the pelvic rim (**top**) and lower pelvis (**middle**) show abnormal heterogeneous fluid and soft tissue densities in the right retroperitoneal space along the right iliac and psoas muscles (**arrows**). The area of high density (**arrowhead**) within the lesion is consistent with hemorrhage (blood clot). The enlarged postpartum uterus is slightly deviated to the left. The normal fat planes along the right pelvic side wall are obliterated compared with the normal fat plane (**f**) on the left side. **Bottom,** An axial CT scan taken below the right renal fossa shows heterogeneous fluid and soft tissue densities (**arrows**) in the right retroperitoneal compartment along the right psoas muscle. The normal bowel loops (**b**) are displaced anteriorly and to the left.

Roerig Division]). Over the next three days, her fever and pain resolved, and her hematocrit remained stable. She was discharged on a regimen of oral antibiotics (amoxicillin and clavulanate potassium [Augmentin; SmithKline Beecham]) for an additional 14 days.

Discussion

Pudendal block is a frequently performed anesthetic procedure, accounting for 14% to 25% of all anesthetic procedures carried out in obstetrics.[1,2] An estimated 5% to 10% of patients in labor receive pudendal anesthesia. It is said to be reasonably effective and "very safe" in providing relief for lower vaginal and perineal pain.[1] The procedure is performed by the transvaginal administration of 1% lidocaine, 1% mepivacaine, or 2% chloroprocaine. A 10- or 20-ml syringe is used with a 5-in 20-gauge needle. The block is achieved by guiding the needle with the middle and index fingers through the Iowa trumpet to the tip of the ischial spine. The needle is advanced 1 cm into the sacrospinal ligament. The pudendal nerve passes just posterior to the junction of the tip of the ischial spine and the sacrospinal ligament. It is recommended to inject 3 ml of the anesthetic, advance the needle, penetrating the sacrospinal ligament, and then inject another 5 to 10 ml. An aspiration test every 2 to 3 ml is done to be assured against intravascular administration. At this point, the internal pudendal artery and vein course near the pudendal nerve. A negative aspiration test in this patient was probably a result of the needle passing cleanly through the vessel, initiating the resultant retroperitoneal bleeding. The procedure is also carried out on the contralateral side.

The pudendal nerve originates from sacral vertebrae S-2, S-3, and S-4, leaving the pelvis through the lower part of the greater sciatic foramen, curves around the ischial spine, and crosses the sacrospinal ligament posterior to it and close to its attachment to the ischial spine. It then reenters the pelvis along the internal pudendal artery at the lesser sciatic foramen. It then enters Alcock's canal, where it lies along the lateral border of the ischiorectal fossa. The pudendal nerve then breaks up into the inferior hemorrhoidal nerve, the perineal nerve, and the dorsal nerve of the clitoris. A successful pudendal block requires blocking the nerve before these terminal divisions.

The primary complications resulting from a pudendal block involve the intravascular administration of anesthetic with resultant neurotoxicity and seizures,[2] cardiotoxicity,[3] or the introduction of infection into the gluteal musculature or retropsoas space with mixed vaginal organisms.[4,5] This may be through the direct inoculation of vaginal organisms into this retropsoas space to form an abscess or seeding of these same organisms into a hematoma formed by vessel perforation (infected hematoma). It has been shown that these abscesses generally contain *Escherichia coli*, *Proteus* species, and anaerobic *Streptococcus* and *Bacteroides* species, which are vaginal flora.[4] There have been cases where these abscesses have been fatal.[5] Patients with this complication will often present after delivery with "fever of unknown origin" and pain to the hip after having received a pudendal block.[4,5] Hematomas and retropsoas or

subgluteal abscesses are recognized complications following a pudendal block,[6] but their incidence, which is low, is unknown. It has been suggested that the incidence of hematoma formation and infection of the hematoma is kept low by compression of the paravaginal tissues by the fetal head.[7(p351)]

A gallium citrate Ga 67 scan may be effective in visualizing a retropsoas abscess.[8] In this report, CT has been shown to be equally effective in visualizing such a retroperitoneal hematoma or abscess. The use of CT to diagnose retroperitoneal fluid collections was recently reviewed.[9] Retroperitoneal hemorrhage at the psoas muscle has been found by CT imaging when it arises as a consequence of a bleeding diathesis or anticoagulation, a ruptured abdominal aortic aneurysm,[9] or most frequently as a complication of femoral catheterization.[10] This is the first report of the use of CT to diagnose retroperitoneal hemorrhage complicating pudendal block. It is the diagnostic method of choice in studying retroperitoneal collections. It also is the most cost-effective technique while providing the same information about this process as can be derived from magnetic resonance imaging.

Vascular injury in the course of pudendal block is not a rare occurrence (as evidenced by positive aspiration tests). Fortunately, most patients with this injury are asymptomatic and have no sequelae, for reasons cited earlier. Physicians must, however, always remain cognizant that retroperitoneal bleeding may be life-threatening because of the possible size of this space. A key to the presence of an infected retroperitoneal hematoma is a postpartum temperature elevation in a patient with a dropping hematocrit. On the other hand, postpartum fever, usually of a wildly spiking nature that does not respond to antibiotics alone and in a patient whose hematocrit is stable, may point to a septic pelvic thrombophlebitis. The latter disorder, which is also rare—1 to 5 per 10,000 vaginal deliveries[11,12]—may similarly be diagnosed by CT imaging of the pelvis.[13-15] Septic pelvic thrombophlebitis requires the addition of heparin for a therapeutic response. Differentiating these two disorders by CT imaging could prevent a catastrophic outcome because the treatment of a patient with heparin in whom there is an underlying vessel perforation is contraindicated. Therefore, if pudendal block is followed by an unexplained fever postpartum, with hip or abdominal pain, CT may help to detect an infected retroperitoneal hematoma or abscess. Either disorder may be life-threatening or severely debilitating[4] and hence must be treated aggressively.

REFERENCES

1. Gabbe S, Niebyl JR, Simpson JL: Obstetrics—Normal and Problem Pregnancies, 2nd edition. New York, NY, Churchill-Livingstone, 1991

2. Cunningham FG, MacDonald PC, Gant NF, Leveno KJ, Gilstrap LC III: Williams Obstetrics, 19th edition. Norwalk, Conn, Appleton & Lange, 1994

3. Bozynski ME, Rubarth LB, Patel JA: Lidocaine toxicity after maternal pudendal anesthesia in a term infant with fetal distress. Am J Perinatol 1987; 4: 164-166

4. Svancarek W, Chirino O, Schaefer G Jr, Blythe JG: Retropsoas and subgluteal abscesses following paracervical and pudendal anesthesia. JAMA 1977; 237:892-894

5. Wenger DR, Gitchell RG: Severe infections following pudendal block anesthesia: Need for orthopaedic awareness. J Bone Joint Surg [Am] 1973; 55:202-207

6. Zador G, Lindmark G, Nilsson BA: Pudendal block in normal vaginal deliveries—Clinical efficacy, lidocaine concentrations in maternal and foetal blood, foetal and maternal acid-base values and influence on uterine activity. Acta Obstet Gynecol Scand (Suppl) 1974; 34:51-64

7. Bowes WA Jr: Clinical aspects of normal and abnormal labor, chap 35, *In* Creasy RK, Resnik R (Eds): Maternal Fetal Medicine—Principles and Practice, 3rd edition. Philadelphia, Pa, WB Saunders, 1994

8. Oster MW, Gelrud LG, Lotz MJ, et al: Psoas abscess localization by gallium scan in aplastic anemia. JAMA 1975; 232:377-379

9. Korobkin M, Silverman PM, Quint LE, Francis IR: CT of the extraperitoneal space: Normal anatomy and fluid collections. AJR Am J Roentgenol 1992; 159:933-941

10. Trerotola SO, Kuhlman JE, Fishman EK: Bleeding complications of femoral catheterization: CT evaluation. Radiology 1990; 174:37-40

11. Duff P, Gibbs RS: Pelvic vein thrombophlebitis: Diagnostic dilemma and therapeutic challenge. Obstet Gynecol Surv 1983; 38:365-373

12. Sweet RL, Ledger WJ: Puerperal infectious morbidity—A two year review. Am J Obstet Gynecol 1973; 117:1093-1100

13. Bahnson RR, Wendel EF, Vogelzang RL: Renal vein thrombosis following puerperal ovarian vein thrombophlebitis. Am J Obstet Gynecol 1985; 152: 290-291

14. Brown CEL, Lowe TW, Cunningham FG, Weinreb JC: Puerperal pelvic thrombophlebitis: Impact on diagnosis and treatment using x-ray computed tomography and magnetic resonance imaging. Obstet Gynecol 1986; 68:789-794

15. Angel JL, Knuppel RA: Computed tomography in diagnosis of puerperal ovarian vein thrombosis. Obstet Gynecol 1984; 63:61-64

A Human Case of Monocytic Ehrlichiosis With Adult Respiratory Distress Syndrome in Northern California

DUC J. VUGIA, MD, MPH
Berkeley, California

ERIC HOLMBERG, MD
Point Reyes Station, California

ERIKA M. STEFFE, MD
Santa Rosa, California

MICHAEL S. ASCHER, MD
DANA GALLO
Berkeley, California

IN THE UNITED STATES, human monocytic ehrlichiosis is an emerging tick-borne infectious disease caused by *Ehrlichia chaffeensis*, a newly identified rickettsial agent that infects mainly mononuclear phagocytes.[1-3] Recently a human granulocytic ehrlichiosis was documented that is caused by an as-yet-unnamed *Ehrlichia* species (closely related to *Ehrlichia equi*) that infects blood granulocytes.[3-5] In both types of human ehrlichiosis, reported cases have often been in older men with a recent history of tick bite or

(Vugia DJ, Holmberg E, Steffe EM, Ascher MS, Gallo D: A human case of monocytic ehrlichiosis with adult respiratory distress syndrome in northern California. West J Med 1996; 164: 525-528)

From the California Department of Health Services, Berkeley, and the Point Reyes Clinic, Point Reyes Station, California. Dr Steffe is in private practice in Santa Rosa, California.

Reprint requests to Duc J. Vugia, MD, MPH, Disease Investigations and Surveillance Branch, Division of Communicable Disease Control, California Department of Health Services, 2151 Berkeley Way, Berkeley, CA 94704.